

REMARKS

In accordance with the foregoing, claims 1-14 are cancelled without prejudice and claims 15-28 are added. No new matter is added. Claims 15-25 are pending and under consideration.

Rejections under 35 U.S.C. § 112, Second Paragraph

In the May 17, 2007 Office Action, claims 1-10 were rejected under the second paragraph 35 U.S.C. § 112, due to language that does not appear in any of currently pending claims 15-25. Therefore, withdrawal of the rejections is respectfully requested.

Rejections under 35 U.S.C. § 103

In the May 17, 2007 Office Action, claims 1, 2, 4, 5, 7, 8, 13 and 14 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the following combinations of references: (1) U.S. Patent No. 5,658,530 to Dunn in view of Japanese Patent Application Publication No. 2000-327315 by Wakamura et al. and U.S. Patent No. 6,004,667 to Sakurada et al. (hereinafter, Sakurada '667); (2) Dunn in view of U.S. Patent No. 5,614,568 to Mawatari et al. and U.S. Patent No. 4,367,312 to Bontinck et al.; and (3) Japanese Patent Application Publication No. 11-342210 to Sakurada et al. (hereinafter, Sakurada '210) in view of Wakamura et al. and Dunn.

In addition, claims 3, 6 and 9 were rejected under 35 USC §103(a) as allegedly being unpatentable over the following combinations of references: (4) Dunn, Wakamura et al., and Sakurada '667 in further view of U.S. Patent No. 4,882,196 to Shimamune et al.; (5) Dunn, in view of Mawatari et al., Bontinck et al. and Shimamune et al.; and (6) Sakurada '210 in view of Wakamura et al., Dunn and Shimamune et al.

In addition, claims 10 and 11 were rejected under 35 USC §103(a) as allegedly being unpatentable over the following combinations of references: (7) Dunn, Wakamura et al., and Sakurada '667 in further view of Japanese Patent Application Publication No. 2000-051041 by Okamoto; (8) Dunn, in view of Mawatari et al., Bontinck et al. and Okamoto; and (9) Sakurada '210 in view of Wakamura et al., Dunn and Okamoto.

In addition, claim 12 was rejected under 35 USC §103(a) as allegedly being unpatentable over the following combinations of references: (10) Dunn, Wakamura et al., Sakurada '667 and Okamoto in further view of Shimamune et al. and (11) Dunn, in view of Mawatari et al., Bontinck et al. and Okamoto and in further view of Shimamune et al.

Finally, claim 4 was rejected under 35 USC §103(a) as allegedly being unpatentable over Bontinck et al.

As claims 1-14 have been canceled, all of these rejections are moot. However, Applicants submit that the May 17, 2007 Office Action relied on an undue multiplicity of combinations of references and that the Office "is not called upon to cite all references that may be available, but only the 'best' [reference] ... multiplying references ... adds to the burden ... of prosecution and should therefore be avoided" (MPEP 904.03 and MPEP 707.07(g)). if claims 15-25 are not allowed, the Examiner is respectfully requested to reject the claims in accordance with MPEP 904.03 and MPEP 707.07(g).

New Claims

First, it is submitted that the new claims 15-25 are fully supported by the specification as filed, as discussed below in more detail; thus, no "new matter" has been added.

New independent claim 15 is directed to a method for preserving food in which the food is brought in contact with sintered (at 580 to 660°C) Ti-modified calcium hydroxyapatite. Claim 15 patentably distinguishes over the cited prior art at least by reciting "sintering the Ti-modified calcium hydroxyapatite at 580 to 660°C" and "bringing food into contact with the sintered Ti-modified calcium hydroxyapatite for storage."

The antibacterial effect of Ti-modified calcium hydroxyapatite (abbreviated Ti-CaHAP, see page 11, lines 20-22) is unexpectedly enhanced by preliminary sintering at 580 to 660° C. This unexpected result is experimentally tested as described in Examples 3 and 4. Applicant also observed that sintered Ti-CaHAP provides a higher antibacterial effect than non-sintered Ti-CaHAP regardless whether the storage is with or without light exposure. In Fig. 3, see line A3 versus line A1 with light exposure, and line A4 versus line A2 without light exposure.

Prior Art

Dunn discloses only TiO₂ as a catalyst but fails to teach or suggest Ti-modified calcium hydroxyapatite, as conceded in the May 17, 2007 Office Action. Okamoto also discloses TiO₂ as a catalyst, but fails to teach or suggest Ti-modified calcium hydroxyapatite.

Wakamura et al. discloses Ti-modified calcium hydroxyapatite, but the Ti-CaHAP is heated only to 100° C (see paragraphs [0019] and [0021] of Wakamura et al.). This is a far lower temperature than 580 to 660°C as specified in claim 15. Wakamura et al. does not teach or suggest using Ti-CaHAP for food preservation.

Sakurada '667 does not teach or suggest that Ti-CaHAP has an antibacterial effect which would make it suitable for usage in food preservation. Thus, Sakurada '667 cannot be a basis for enhancing the antibacterial effect of Ti-CaHAP by sintering at 580 to 660°C.

In Shimamune et al., a base layer of calcium phosphate is formed on a substrate of titanium or titanium alloy. There is no teaching or suggestion that Ti-CaHAP is formed at the boundary between the Ti-substrate and the base layer. Moreover, it is not realistic to assume that even if Ti-CaHAP were formed, it would be possible to bring it in contact with food since a calcium phosphate compound covers the base layer which is in contact with the Ti-substrate. Shimamune et al. discloses heating at 300 to 900°C, but this heating is performed to calcinate the calcium phosphate compound and not to sinter Ti-CaHAP.

The other cited references do not correct or compensate for the already identified failures of the main references to anticipate or render obvious the claim limitations. Applicant also notes that in *KSR Corp. v. Teleflex Inc.* (2007), the Supreme Court maintained that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed.¹ The numerous multiple reference § 103(a) rejections put forth in the outstanding Office Action are perceived as hindsight reconstructions without a required unity conveyed by a proper support for combining the teachings disclosed therein.

Claims 16-19 depending from claim 15 are patentable at least by inheriting patentable features from independent claim 15.

New independent claim 20 is directed to a "food preserving article, comprising a substantially surrounding barrier having an inner surface, coated with a Ti-modified calcium hydroxyapatite which has undergone sintering at 580 to 660°C, in contact with stored food." Therefore, claim 20 patentably distinguishes over the prior art for at least the reasons discussed above. Claims 21 and 22 are also patentable at least by inheriting patentable features from claim 20.

¹ Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. KSR, slip op. at 14.

New independent claim 23 is directed to a "food preserving article produced by a method comprising: sintering a material, containing a Ti-modified calcium hydroxyapatite, at 580 to 660°C." Therefore, claim 23 patentably distinguishes over the prior art for at least the reasons discussed above. Claims 24 and 25 are also patentable at least by inheriting patentable features from claim 23.

Conclusion

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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